CASE STUDY REPORT #85
BIG BEAR LAKE
BEAR CREEK

## I. Project Description

The Big Bear Lake drainage basin on Bear Creek is situated within the upper Santa Ana River watershed at an elevation of 6,744 feet (see Figure 1). It encompasses approximately 38 square miles and the average precipitation in the region is approximately 30 inches.

The first dam impounding Big Bear Creek was built in 1884. In 1912 the existing dam was constructed by the Bear Valley Mutual Water Company. This reservoir impounds 72,000 acre-feet covering 3,000 acres and is primarily used for irrigation and municipal water supply.

## II. Pre-Project Condition

Streamflows in Bear Creek prior to 1884 are unknown, but it has been reported that the original reservoir went dry during:

October to November 1898

August to November 1899

October to November 1904

These records may reflect the variable nature of runoff in the natural Bear Creek watershed.

The stream is in a steep walled canyon that contains many tributary streams which augment the natural streamflow of Bear Creek.

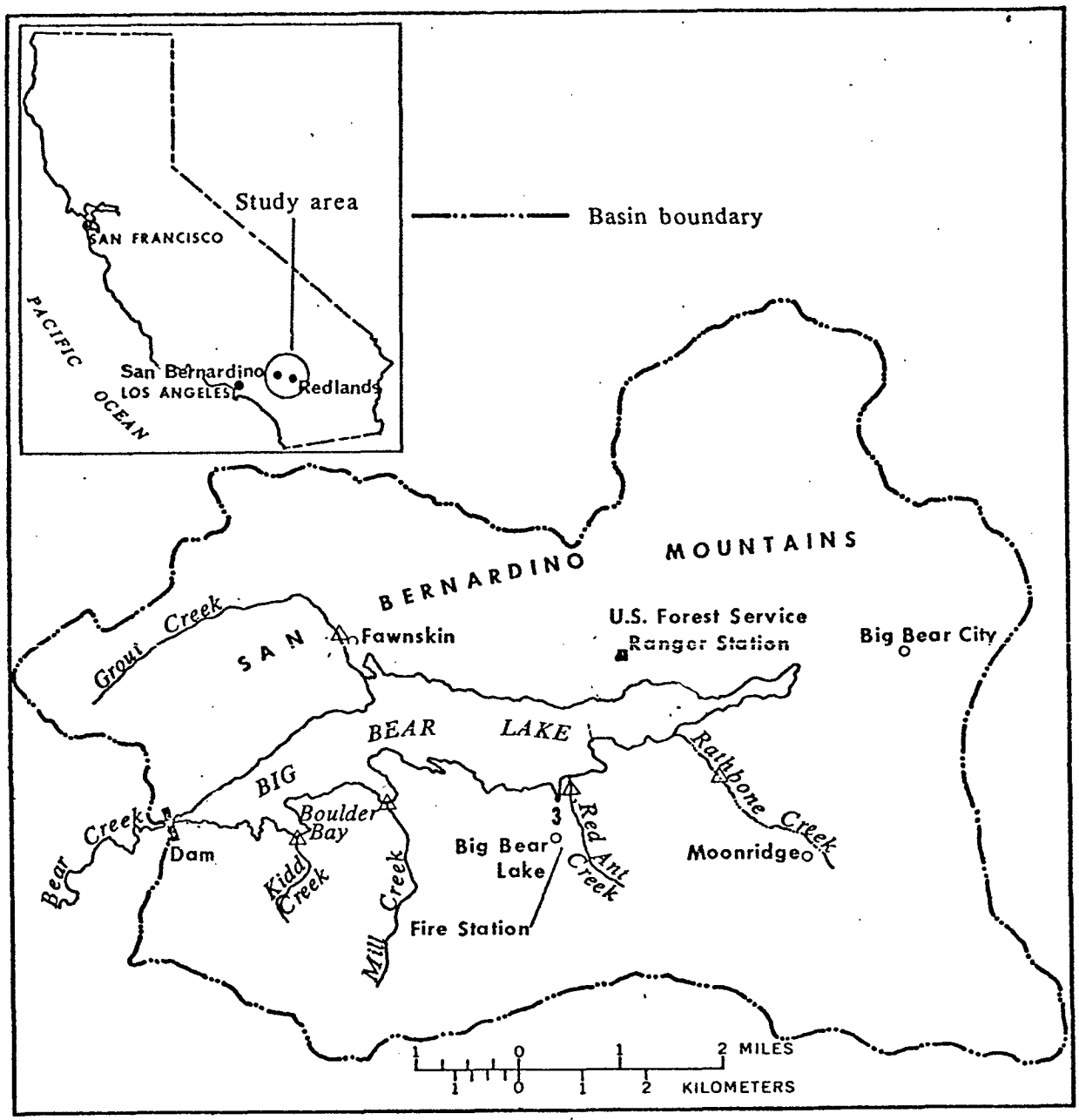



Figure 1

LOCATION MAP

Source: U. S. Geological Survey, 1974.

There was a scarcity of information on the fish populations in Bear Creek prior to 1884 when the stream was first dammed. The variable nature of streamflow could have limited the size and distribution of native fish populations. It is known that historically the Santa Ana River watershed supported widely distributed populations of unarmored, three-spined sticklebacks which are now endangered (DFG 1974).

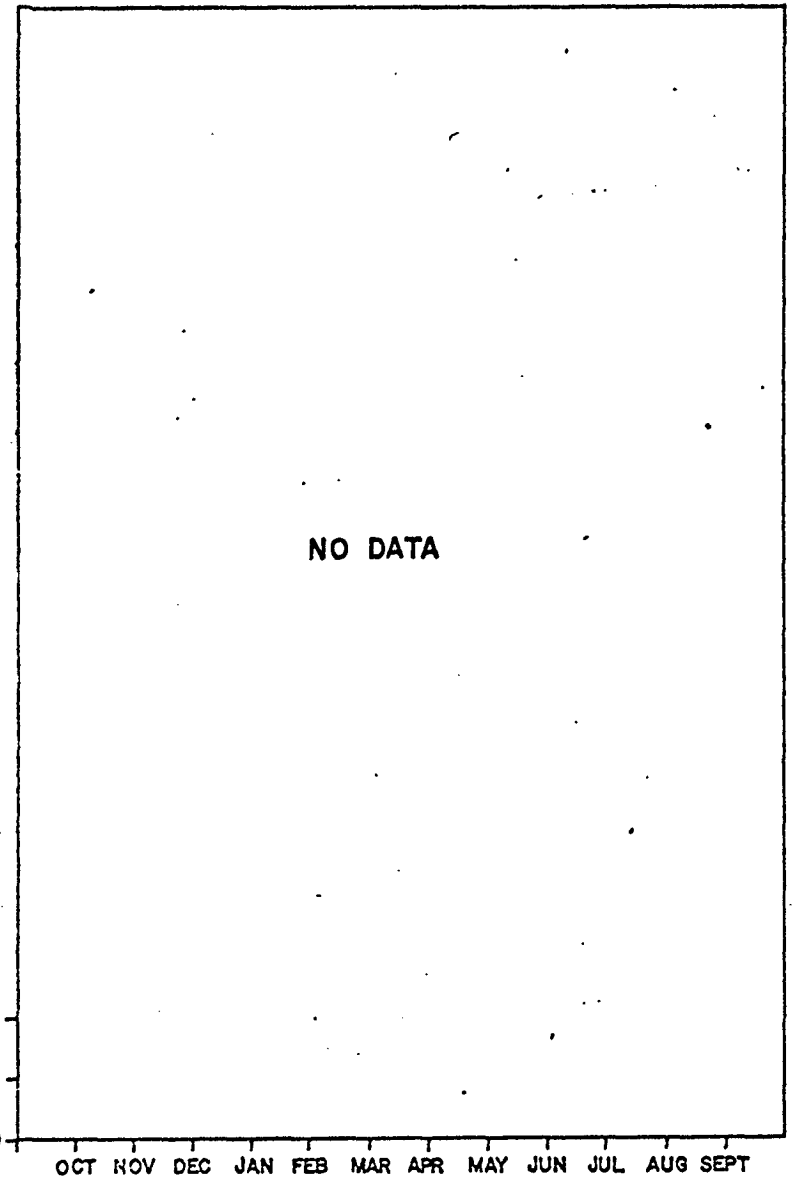
## III. Project Development

Water rights for the Big Bear Project were secured by Bear Valley Mutual Water Company without protest from the DFG. Presently there is no instream flow reservation for preservation of fish and wildlife associated with the Bear Creek Project.

## IV. Post-Project

The operation of Big Bear Dam has provided mean monthly streamflows greater than 10 cfs from November through July (see Figure 2). During the dry season August through October there are records of zero flow conditions. Springs and subsurface accretion from the reservoir augment flows during periods of no release and maintain fishlife in the stream (Richardson, pers. comm.).

There are self-sustaining populations of rainbow and brook trout present in the stream which receive supplemental stocking from the DFG. The stream fishery has been destroyed three times as a result of the chemical treatment of Big Bear Reservoir.




PRE-PROJECT:
GAUGE STATION NO.
SOURCE:

POST-PROJECT: OCTOBER 1951—SEPTEMBER 1973
GAUGE STATION NO. USGS 11051.5
SOURCE:

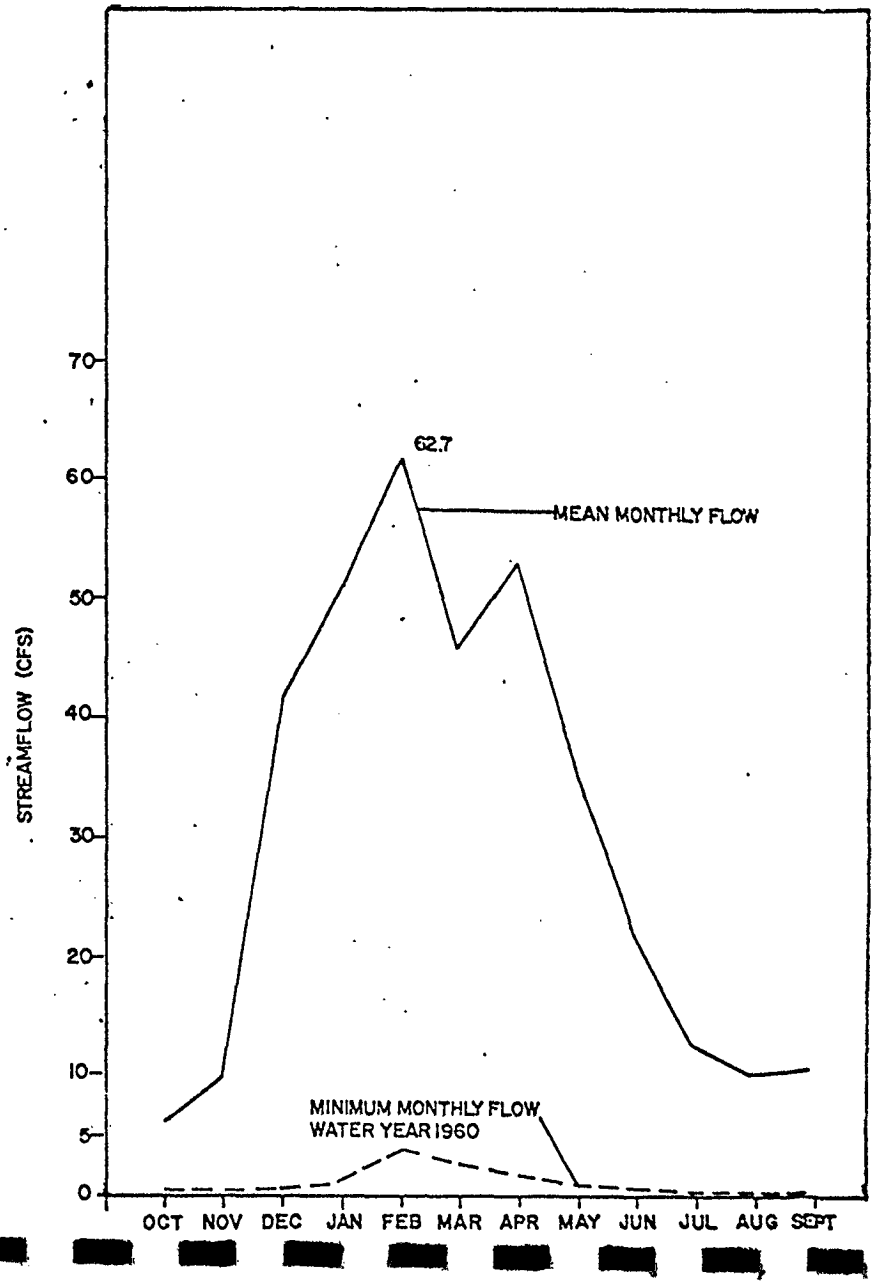



FIGURE 2
STREAMFLOW CONDITIONS, BEAR CREEK
BIG BEAR LAKE

Bear Creek below the dam was restocked after each chemical treatment. Detailed records of the restocking were not available except for restocking after the last chemical treatment in 1961 when 5,000 brown trout fingerlings were planted. Bear Creek was again restocked in 1974 after a large brush fire decreased fish populations (Richardson, pers. comm.). Under normal stream conditions a self-propagating trout population is present. The California DFG has recently proposed that Bear Creek below Big Bear Lake to the confluence of the Santa Ana River be included in California's Wild Trout Program (Richardson, pers. comm.).

Another characteristic of Bear Creek is the high level of nutrients present in the stream as a result of releases from Big Bear Lake, which has been shown (USGS, 1974) to be "moderately eutrophic".

The affects of nutrients upon the stream environment was not evaluated in any of the data reviewed.

## V. Conclusions

The Big Bear Project was developed at an early date for irrigation water supply and stabilized flows in Bear Creek during the irrigation season. None of this streamflow was ever allocated to the preservation of fish and wildlife and it is difficult to analyze if the altered flow had any effect on the stream because a description of pre-project conditions was never discovered.

There have never been any investigations conducted in the stream to determine successive instream flow needs. The present stream conditions are augmented by contributing springs, and a population of brown trout is effectively maintained by the stream.

## BIBLIOGRAPHY


Personal Communications

Richardson, William. 1976. Fisheries Management Supervisor, California Department of Fish and Game, Region 5, Long Beach.

References

California. Department of Fish and Game. 1974. At the crossroads. A report on California's endangered and rare fish and wildlife. 112 pp.

U. S. Geological Survey. 1974. A water quality reconnaissance of Big Bear Lake, San Bernardino County, California 1972-73. 85 pp.